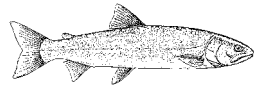


ENDANGERED SPECIES ACT



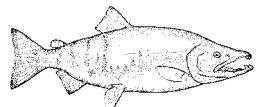
CHINOOK

Proposed Listing as
Threatened for Puget Sound



BULL TROUT

Proposed Listing as
Threatened for Puget Sound



CHUM

Depressed; Proposed Listing
as Threatened for Hood Canal



SEA-RUN CUTTHROAT

Status Determination
December 1998



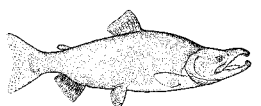
COHO

Status Determination
Mid-1999



STEELHEAD/RAINBOW

At Risk of Future Listing



SOCKEYE

Depressed; Listing Unlikely



PINK

Some Runs Extinct;
Others Still Healthy

Status descriptions are
for Puget Sound runs.



King County, WA

ECOLOGY OF PACIFIC SALMON AND CHINOOK; THE STATUS OF PUGET SOUND STOCKS

Salmon Life Cycle

Salmon hatch in freshwater from eggs laid in the gravel beds of rivers and streams (and in some cases along lake shorelines). Except for steelhead and cutthroat, adults die after spawning a single time. Upon hatching, juveniles spend from hours to years in the freshwater environment before migrating to the sea to grow to adulthood. Oceanic migrations typically take them northward along the continental shelf as many as thousands of miles, often into the Gulf of Alaska and beyond. On reaching maturity, they migrate from the ocean back to the rivers and streams of their birth to spawn.

Range and Adaptation

All Pacific salmon are members of the genus *Oncorhynchus*, meaning “bent snout”. Their home streams range from southern California to northern Alaska and from Siberia southward to Hokkaido, Japan. Salmon are well-adapted to gravel-bedded rivers and streams with clear, well-oxygenated waters that remain cold throughout the year (42-58° F). Gravels must be relatively free from silts and fine sands to allow free flow of water and oxygen to eggs deposited in the inter-gravel spaces. Various salmon species assort themselves by stream size, gravel size, flow and depth of water, and timing of return. Watershed-specific variations in these characteristics have produced populations that are “fitted” to these environments and that differ in subtle ways from adjacent populations. This **local adaptation** is a fundamental characteristic of salmon. Seven species are represented in the waters of King County and Puget Sound: Chinook; coho; pink; chum; sockeye; steelhead/rainbow; and cutthroat.

Oncorhynchus tshawytscha—Chinook, or “King” Salmon

Chinook are the most likely salmon species in King County to be affected soon by listings proposed under the ESA. Chinook are found in the Snoqualmie, Cedar, Green and White river systems. Some basic facts about Chinook salmon include:

- Chinook are the largest of all Pacific salmon, averaging 36 inches in length and 22 pounds in weight; they also are the least abundant species.
- Chinook spawn mostly in large streams and are found in all major watersheds in Puget Sound. The largest runs in the Sound are on the Skagit, Stillaguamish and Snohomish (including the Snoqualmie/Skykomish) rivers. Chinook are also present in smaller tributaries, including Bear Creek, North Creek and Newaukum Creek in King County. Virtually all Puget Sound populations are far below what are believed to be their historic numbers; most have declined from 18% to more than 90% since the 1960s.
- There are spring, summer and fall runs of Chinook in Puget Sound; fall runs, which migrate up parent streams from late July through September, tend to be the most abundant.
- Adult Chinook die within 2-5 days of spawning; their eggs hatch in about 60 days. Newly hatched salmon, called “alevins”, remain in the gravel for about 3 weeks; upon emerging, the “fry” or “parr” remain in freshwater for about 3-6 months (in the Lake Washington system, some may reside in the lake for 2-3 years), feeding on stream and terrestrial insects. Now called “smolts”, they migrate downstream to Puget Sound, where they feed and grow for several weeks to over a year; they then migrate northward to the Gulf of Alaska, where they feed on small fishes and krill for 2-4 years before migrating homeward to spawn.

For more information, check the website at <http://www.salmon.gen.wa.us/> or call the Salmon Helpline at 1-877-SALMON-9

THE STATUS OF WILD SALMON IN PUGET SOUND; CHINOOK TO BE LISTED?

In 1991, the Endangered Species Committee of the American Fisheries Society (AFS) published an article reviewing the status of Pacific Salmon stocks from California, Oregon, Idaho and Washington in *Fisheries* magazine¹. The article was later corroborated independently by the National Research Council². The AFS committee found that:

- **More than 75% of Pacific salmon populations were severely depleted and at some risk of extinction;**
- **Eighteen of the 214 stocks reviewed appeared to be extinct; 101 were found to be at high risk of extinction; and**
- **Salmon had disappeared from more than 40% of their historic range.**

Generally speaking, the health of salmon stocks worsened the further south they were found along the Pacific Coast, with the trend being even worse in areas heavily influenced by dams and urban development. The healthiest stocks were in Alaska and northern British Columbia.

These findings led the National Marine Fisheries Service (NMFS) to initiate a coast-wide assessment of sea-going salmon and trout in 1992, consistent with its responsibility under the Endangered Species Act; NMFS is now completing this assessment. In Puget Sound, NMFS has focused its concerns on coho and Chinook populations and on chum populations in Hood Canal. Virtually all Puget Sound populations of Chinook salmon are far below what are believed to be their historic numbers; most have declined from 18% to more than 90% since the 1960s. NMFS has determined that for Chinook—and possibly coho—the populations that inhabit the various rivers of the Sound are genetically related and thus share a common destiny; for chum, two population segments in Hood canal are closely related. Such related populations are termed **Evolutionarily Significant Units** (ESUs) and are the biological unit for listing salmon species under the ESA.

NMFS proposed listing Puget Sound Chinook and Hood Canal chum as Threatened under the ESA in March 1998, and the U.S. Department of Fish and Wildlife proposed listing bull trout as Threatened under the ESA in June 1998. Sea-run cutthroat and coho are expected to be proposed for listing by the year 2000. The ESU for Puget Sound Chinook includes stocks from all rivers in Puget Sound and Hood Canal, including the Elwha and Dungeness rivers on the Strait of Juan de Fuca.

In 1992, the Washington Department of Fish and Wildlife conducted a status survey of salmon and steelhead in Washington waters. Published in 1993, the Salmon and Steelhead Stock Inventory (SASSI) reviewed 148 stocks in Puget Sound. The review found 11 stocks that were “critical”—that is, subject to permanent harm or extinction; these included stocks of Chinook, chum and steelhead. It found 44 that were “depressed”—that is, whose production was below expected levels; these included stocks of coho and, in Hood Canal, pink salmon. It found 93 stocks to be “healthy”—though even these did not distinguish between fish of hatchery or natural origin, only that they returned to spawn in the wild.

The best available information suggests that freshwater habitat loss and modification has been the most significant cause of decline for stocks in Puget Sound, particularly for Chinook and coho. Poor ocean conditions and a failure to curtail fishing pressure have accelerated the decline.

1. Pacific Salmon at the Crossroads...*Fisheries*: (16):2. March 1991
2. Upstream: Salmon and Society in the PNW. NRC, 1996